The Value of Immunization for God's People

John D. Grabenstein

Among all the medical advances of the last century, the benefits of immunization far outweigh the benefits of antibiotics, surgery, and organ transplants. In fact, the only technology that has improved the length and quality of human life more than vaccines has been a sanitary water supply.[1]

The debate over the moral status of certain viral vaccines, related to human-derived cell lines in which the viruses are grown, has been conducted in this journal and in other publications.[2] Rather than revisit those arguments, this article provides a general defense of immunization using historical and medical evidence. This argument in favor of immunizations is based on both the scientific and the Christian value of protecting and serving others.

[1] Centers for Disease Control and Prevention (CDC), "Achievements in Public Health, 1900-1999: Impact of Vaccines Universally Recommended for Children—United States, 1990–1998," *Morbidity and Mortality Weekly Report (MMWR)* 48.12 (April 2, 1999): 243–248; CDC, "Achievements in Public Health, 1900–1999: Control of Infectious Diseases," *MMWR* 48.29 (July 30, 1999): 621–629.

[2] Edward J. Furton, "Catholic Refusals of Immunization," *Ethics & Medics* 30.12 (December 2005):1–2; National Catholic Bioethics Center, "Analysis and Commentary on 'Moral Reflections on Vaccines Prepared from Cells Derived from Aborted Human Fetuses' of the Pontifical Academy for Life, June 5, 2005," http://www.ncbcenter.org/PAV_Vaccine2.pdf; Daniel P. Maher, "Vaccines, Abortion, and Moral Coherence," *National Catholic Bioethics Quarterly* 2.1 (Spring 2002): 51–67; Edward J. Furton, "Vaccines Originating in Abortion,"*Ethics & Medics* 24.3: (March 1999): 3–4; John D. Grabenstein, "Moral Considerations with Certain Viral Vaccines," *Christianity and Pharmacy* 2.2 (1999): 3–6.

Tamed, Exiled, but Out There

Infectious diseases have long plagued the Earth. The twentieth century was no different, but immunization successfully hampered the spread of disease, especially in the United States. Widespread diphtheria immunization eradicated this devastating killer of young children, providing the greatest single advancement in life expectancy contributed by any vaccine.[3] Poliomyelitis, which caused dreadful crippling and paralysis, was tamed in the United States by Jonas Salk's and Albert Sabin's vaccines in the 1960s.[4] A global smallpox vaccination program vanquished smallpox infection from the planet by 1980.[5] Progressively since the 1950s, more infections have been countered by vaccines. Today, twenty-two infections are vaccine-preventable in the United States, keeping the population healthy.[6]

Smallpox no longer travels among human communities anywhere on earth, but the other vaccine-preventable diseases are merely contained. After the Soviet-era public-health system broke down, cases of diphtheria resurged in Russia and the former Soviet republics in the 1990s.[7] Poliovirus continues to spread among children in Nigeria, Indonesia, India, and elsewhere. Because polioviruses circulate only among humans, and not among animals, it is possible to eradicate poliomyelitis from the planet, but only after widespread immunization.[8]

Developing countries continue to struggle with hepatitis A, hepatitis B, rabies, tetanus, measles, rubella, rotavirus, and many other infections that vaccines can prevent, if used. These diseases would be much more prevalent in the United States if immunization was not widely utilized.

It is true that domestic circulation of measles and rubella viruses in the United States has essentially ceased.[9] But as long as measles and rubella viruses circulate

---

[3] J. P. Bunker, H. S. Frazier, and F. Mosteller, "Improving Health: Measuring Effects of Medical Care," *Milbank Quarterly* 72.2 (1994): 225–258; J. P. Bunker, "Medicine Matters after All," *Journal of the Royal College of Physicians London* 29 (1995): 105–112.

[4] John D. Grabenstein, "Immunization from the Perspective of a Millennium," *Hospital Pharmacy* 35 (June 2000): 619–630.

[5] Frank Fenner et al., *Smallpox and Its Eradication (*Geneva: World Health Organization, 1988).

[6] John D. Grabenstein, *ImmunoFacts: Vaccines and Immunologic Drugs* (St. Louis: Wolters Kluwer Health, 2006).

[7] A. M. Galazka, S. E. Robertson, and G. P. Oblapenko, "Resurgence of Diphtheria," *European Journal of Epidemiology* 11 (1995): 95–105.

[8] CDC, "Global Polio Eradication Initiative Strategic Plan," *MMWR* 53.05 (February 13, 2004): 107–108.

[9] Advisory Committee on Immunization Practices (ACIP), "Measles, Mumps, and Rubella—Vaccine Use and Strategies for Elimination of Measles, Rubella, and Congenital Rubella Syndrome and Control of Mumps,"*MMWR* 47.RR-8 (May 22, 1998): 1–57, http://www.cdc.gov/mmwr/preview/ mmwrhtml/ 00053391.htm; ACIP, "Control and Prevention of Rubella: Evaluation and Management of Suspected Outbreaks, Rubella in Pregnant Women, and Surveillance for Congenital Rubella Syndrome,"*MMWR* 50. RR-12 (July 13,

overseas, we cannot become complacent. Immigrants and international visitors can bring the microbes from their home countries with them as they travel across borders.

The United States continues to receive imported cases of measles, rubella, poliomyelitis, and many other preventable infections, brought to the country by various means of travel.[10] These cases are not historic; they are part of our current national landscape. These reports have a common theme: the infected traveler spreads the infection to susceptible Americans through human interaction, such as in school or church, at work or the market.

The Cork in the Bottle

Figuratively, vaccines have sent these microbial genies back to their bottles, here in the United States and wherever the vaccines are used widely. The microbes may be forgotten by many Americans, but the diseases are not gone. The germs still exist, with vaccines acting as a kind of cork that can keep the microbes bottled up. Vaccines act as a shield that keeps germs away from human contact.

But vaccines have no value sitting idle in a refrigerator. Vaccines only work if we use them to defend ourselves. If we stop immunizing, then the cork falls out of the bottle, allowing the microbes to escape and return to their destructive ways.

The United States ceased routine smallpox vaccinations because the contagious virus was eradicated. Public health workers are close to eradicating poliomyelitis, but stubborn pockets of microbes remain in several countries. In Nigeria, for example, religious disputes over immunization programs pose a serious threat to finally eradicating poliomyelitis from the planet.[11]

For the Sake of Others

The most obvious value of immunization is the direct effect of preventing disease. The immunized person acquires immunity against infection. Indirect effects of immunization also benefit the human population.[12] In other words, when I get immu-

---

2001): 1–23, http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5012a1.htm; CDC, "Achievements in Public Health: Elimination of Rubella and Congenital Rubella Syndrome—United States, 1969–2004," *MMWR* 54.11 (March 25, 2005): 279–282, http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5411a5.htm.

[10] CDC, "Imported Measles Case Associated with Nonmedical Vaccine Exemption—Iowa, March 2004," *MMWR* 53.11 (March 26, 3004): 244–246; CDC, "Imported Vaccine-Associated Paralytic Poliomyelitis—United States, 2005," *MMWR* 55.04 (February 3, 2006): 97–99; CDC, "Imported Case of Congenital Rubella Syndrome—New Hampshire, 2005," *MMWR* 54.45 (November 18, 2005): 1160–1161.

[11] CDC, "Progress toward Poliomyelitis Eradication—Nigeria, January 2004–July 2005," *MMWR* 54.35 (September 9, 2005): 873–877; C. Chen, "Rebellion against the Polio Vaccine in Nigeria: Implications for Humanitarian Policy," *African Health Sciences* 4.3 (February 2, 2005): 205–207.

[12] John D. Grabenstein, "Being Immunized for the Sake of Others," *Hospital Pharmacy* 34 (January 1999): 54, 57–60,107; John D. Grabenstein, "The Social Benefits of Vaccination," *Ethics & Medics* 25.8 (August 2000):1–3.

nized, I enhance the health of other people. The term "herd immunity"—commonly known in veterinary medicine—means that immunization of most members of a group will indirectly protect the others. For human communities, this might better be termed "group immunity" or "community immunity." Herd immunity is a characteristic of a group or population, rather than a characteristic of any one group member. As more people become immune, germs find it increasingly difficult to infect the next person. If enough individuals are immune, an outbreak will weaken and wind down.

Immunization against rubella provides a good example of the indirect benefit: rubella immunization of boys and men helps prevent rubella infection of women during pregnancy, which prevents devastating birth defects in their children.[13] When the United Kingdom implemented a policy to administer rubella vaccine just to young women, health officials found they could not prevent rubella outbreaks. When the United Kingdom switched to the policy effective in the United States—universal immunization of both males and females—rubella was contained. Immunizing males made it less likely for females to become infected.

The United States will confront this issue again in the near future with human papillomavirus (HPV) vaccines. These vaccines prevent the infections that lead to cervical cancer in women.[14] HPV infections are transmitted sexually, so immunizing boys and young men can be expected to reduce the infection rate (and thus the cancer rate) among women. It might be argued that such infections represent the "wages of sin," but virtuous women can also be infected by their husbands. Sin can be forgiven in men and women, but papillomavirus infection cannot be reversed.

Herd immunity was a key factor in controlling smallpox, poliomyelitis, measles, and other infections. But herd immunity has no bearing on an individual's personal protection from infection. In fact, herd immunity is less desirable than personal immunity, from the individual's perspective.

Sociologists have a somewhat derogatory term for people (or parents) who decide to take advantage of herd immunity or group immunity, forgoing immunization themselves (or for their children). Sociologists call such people "free-loaders" or "free riders."[15] Once a vaccine-preventable infection is contained by immunization, then

---

[13] CDC, "Elimination of Rubella and Congenital Rubella Syndrome—United States, 1969–2004," *MMWR* 54.11 (March 25, 2005): 279–282, http://www.cdc.gov/mmwr/preview/ mmwrhtml/ mm5411a5.htm.

[14] L. L. Villa et al., "Prophylactic Quadrivalent Human Papillomavirus (Types 6, 11, 16, and 18) L1 Virus-like Particle Vaccine in Young Women: A Randomised Double-Blind Placebo-controlled Multicentre Phase II Efficacy Trial," *Lancet Oncology* 6.5 (May 2005): 271–278; D. M. Harper et al, "Efficacy of a Bivalent L1 Virus-like Particle Vaccine in Prevention of Infection with Human Papillomavirus Types 16 and 18 in Young Women: A Randomised Controlled Trial," *Lancet* 364.9447 (November 13–19, 2004): 1757–1765; G. P. Garnett, "Role of Herd Immunity in Determining the Effect of Vaccines against Sexually Transmitted Disease," *Journal of Infectious Diseases* 191, Suppl 1 (February 1, 2005): S97–S106.

[15] Thomas May and Ross D. Silverman, "Free-Riding, Fairness, and the Rights of Minority Groups in Exemption from Mandatory Childhood Vaccination," *Human Vaccines* 1.1 (January 2005): 12–15.

the rare risk of an adverse reaction to a vaccine may seem to outweigh the personal risk of being infected.[16] The "free-loader" lets the immunized people risk adverse effects and then receives the benefit of living in a highly immunized community.

The dubious ethical basis for such behavior is obvious: it is inequitable and uncharitable. It is also behavior that cannot be sustained if emulated widely over a period of years. If enough people "free-load," then the community's collective immunity dissipates and disease outbreaks resume. Recent examples include pertussis epidemics in Japan and mumps outbreaks in the United Kingdom.[17]

To be fair, the opposite can also happen. Society can benefit from high immunization levels that produce rare adverse events in vaccine recipients. America responds to this incongruity with the Vaccine Injury Compensation Program.[18] When most individuals, plus society as a whole, gain from immunization, it is appropriate for society to underwrite the consequences of rare adverse vaccination events in the few people negatively affected.

Susceptibility and Severity

Sometimes, particular communities within the United States forgo a few or all immunizations for reasons of philosophy or lack of trust. Numerous examples of measles and rubella outbreaks among the Amish and other religious sects illustrate how clusters of susceptible people can experience small epidemics, even within a highly immunized society.[19] Over the past few decades, there have been outbreaks

[16] For example, the risk of a serious, even fatal, allergic reaction to a vaccine is about one per one hundred thousand to one million immunizations administered. Numerically, this could exceed the risk of contracting tetanus or diphtheria or some other vaccine-preventable infection in the United States today. But if immunization ceased, disease rates would rapidly increase, making it apparent that one should compare adverse-reaction risks to the risk of disease when a vaccine is unavailable, not when the vaccine is widely used. By that measure, vaccines are clearly prudent protection. See Laura Lane, Arlene Reynolds, and Mary Ramsay, "When Should Vaccination Be Contraindicated in Children?" *Drug Safety* 28.9 (2005): 743–752.

[17] Edward J. Gangarosa et al., "Impact of Anti-Vaccine Movements on Pertussis Control: The Untold Story,"*Lancet* 351.9099 (January 1998): 356–361; Robert T. Chen and Beth Hibbs, "Vaccine Safety: Current and Future Challenges," *Pediatric Annals* 27.7 (July 1998): 445–455; and John D. Grabenstein, "The Natural History of a Vaccine and Its Disease," *Hospital Pharmacy* 31(1996): 559, 563–564, 567–568, 571–572. If you would like to see why pertussis is called whooping cough, view the video clips at www.vaccineinformation.org/video.

[18] John D. Grabenstein, "Compensation for Vaccine Injury: Balancing Society's Need and Personal Risk," *Hospital Pharmacy* 30.9 (September 1995): 831–832, 834–836. For more information on the National Vaccine Injury Compensation Program, see www.hrsa.gov/vaccinecompensation/.

[19] D. A. Salmon et al., "Health Consequences of Religious and Philosophical Exemptions from Immunization Laws: Individual and Societal Risks of Measles," *Journal of the American Medical Association* 282.1 (July 7, 1999): 47–53; D. V. Rodgers et al., "High Attack Rates and Case Fatality during a Measles Outbreak in Groups with Re-

of measles, rubella, hepatitis A, and other vaccine-preventable infections in parishes, religious communities, and religious schools. In one analysis, the risk of measles was thirty-five times higher among people claiming exemptions to immunization, compared to the general population.

If you substitute a Catholic parish for an Amish village, the same risk of susceptibility would exist. The infectious risk has nothing to do with religious denomination or the righteousness of the objection. Preventable infections have led and can lead to hospitalizations, disabilities, and deaths.

It is not enough for a community's average level of immunization to be high. For example, the average measles immunization rate for first-graders in the United States is about 95 percent.[20] But if geographic clusters within an inner-city neighborhood, a suburb, a rural town, an island, a parish, or some other area are immunized at only 60 percent or 80 percent, epidemics can occur. Epidemics that start in these communities can spread beyond the cluster. The consequences reach beyond the individual. One person's decision to be immunized might affect another person's chance of being infected. When it comes to preventing the spread of contagious disease, we are our brother's keeper.

A community can afford to have a small number of conscientious objectors, as it were, to immunization. But each unimmunized person adds to the vulnerability of the group. A growing number of exposed people will increase the risk of infectious disease. One contagious person among a cluster of susceptible people can cause an outbreak.

Neighbors have a responsibility to help each other. As the ease of transport increases, cooperation is now measured on a global scale, rather than the shorter distances of earlier times. Social compacts of neighborly duties are rooted in both philosophy and religion. The duty to assist those in need is common among different religions, and is a specific Christian obligation.

Our parents, grandparents, and great grandparents feared their loved ones' contracting smallpox, diphtheria, or polio. Less well known to the public has been the number of people who died of pneumonia after contracting measles. In the 1970s and 1980s, *Haemophilus influenzae* type b (Hib) bacteria were the leading cause of acquired mental retardation (resulting from meningitis and other problems), creating

ligious Exemption to Vaccination," *Pediatric Infectious Disease Journal* 12 (1993): 288–292; P. A. Briss et al., "Rubella among the Amish: Resurgent Disease in a Highly Susceptible Community," *Pediatric Infectious Disease Journal* 11.11 (November 1992): 955–959; A. T. Pavia et al., "A Community-wide Outbreak of Hepatitis A in a Religious Community: Impact of Mass Administration of Immune Globulin," *American Journal of Epidemiology* 131.6 (June 1990):1085–1093; T. Novotny et al., "Measles Outbreaks in Religious Groups Exempt from Immunization Laws," *Public Health Reports* 103.1 (January–February 1988): 49–54.

[20] Centers for Disease Control and Prevention, "Vaccination Coverage among Children Entering School—United States, 2003–04 School Year," *MMWR* 53 (2004): 1041–1044,www. cdc.gov/mmwr/preview/mmwrhtml/mm5344a4.htm.

as many problems as poliomyelitis at its peak, yet the Hib germ was not as feared as poliovirus.[21] Photos of pediatric wards filled with iron lungs lingered in the national consciousness, whereas isolated (but equally numerous) deaths from Hib infection failed to register.

It is easy for epidemiologists and health officials to worry about collective statistics. But infections devastate individual lives. Tetanus is a rare infection, but it killed one of my father's relatives. Congenital rubella syndrome rarely occurs in the United States anymore, but another family member of mine gave birth to a child with mental retardation caused by rubella infection during pregnancy.

Chickenpox is widely perceived as "just a rash," but it kills several dozen children a year in the United States, and many more overseas. Severe cases of chickenpox can progress to pneumonia or encephalitis (swelling of the brain). Chickenpox can involve four hundred to five hundred separate lesions. Severe bacterial infection at one or more of those breaks in the skin can lead a child to an intensive care unit. Before the chickenpox vaccine was licensed in the United States, about eleven thousand people were hospitalized and up to a hundred people died each year from complications of chickenpox.[22]

Rabies causes an encephalitis that is almost universally fatal. Hepatitis A, especially when contracted by an adult, causes serious liver disease. Hepatitis B causes liver damage, including cancer of the liver. The administering of vaccines for these fatal diseases greatly reduces the risk of contracting those diseases. In the case of rabies, emergency vaccination after exposure will prevent almost certain death.

Because no human is an island, and because contagious diseases pose a collective danger, the community has a duty to help protect its members (especially its most vulnerable members) from transmittable diseases. Vaccines are vital tools for this purpose. And individuals have a duty to cooperate, to work together, and to refrain from actions that put neighbors at risk for those diseases.

Regulation and Policy Making

For a vaccine to be distributed in the United States, it must be licensed by the Food and Drug Administration (FDA). To obtain an FDA license, the sponsor of a new vaccine (typically its manufacturer) submits data demonstrating the effectiveness of the vaccine (its efficacy, proof that it prevents infection) and the safety of the vaccine (that symptoms or health problems after immunization are mild and temporary, or are similar to those seen in unimmunized people). The FDA consults with civilian medical experts (typically accomplished university professors) called the Vaccines and Related Biological Products Advisory Committee (VRBPAC) before mak-

[21] K. M. Bisgard et al., "*Haemophilus influenzae* Invasive Disease in the United States, 1994–1995: Near Disappearance of a Vaccine-Preventable Childhood Disease," *Emerging Infectious Diseases* 4.2 (April–June 1998): 229–237. For more stories of real people devastated by a vaccine-preventable infection, see www.immunize.org/stories/.

[22] Photos of horrible (if uncommon) consequences of chickenpox, caused by varicella-zoster virus, appear at www.vaccineinformation.org/photos/.

ing a decision to license a new vaccine.[23] Comparing one country to another, the FDA has a reputation as being among the most stringent drug regulators in the world.

One of the key issues in assessing safety is accumulated experience. The U.S.-licensed form of rubella vaccine goes by the brand name of Meruvax II, made from the RA 27/3 strain of rubella virus grown in WI-38 cells. This product is one of the constituents of the triple measles-mumps-rubella vaccine and the new fourfold combination measles-mumps-rubella-varicella vaccine (ProQuad). This rubella vaccine has been administered to literally hundreds of millions of Americans. Thus, its safety profile is very well understood.

If a sponsor wanted to apply for a license for another rubella vaccine, the sponsor would present to the FDA detailed safety information about the tens of thousands of recipients who participated in the modern clinical trials. But the public would be interested in whether the risks of very rare side effects, at the one per one hundred thousand or one per million level, were the same with the current and the new vaccines. Such trials would be prohibitively expensive. In most cases, the profit margins on vaccine manufacture are not sufficient to encourage such risk-taking by manufacturers. The FDA would need to assume that no very rare adverse effects had gone undetected in the information assembled by the sponsor.[24]

It is true that some countries have licensed vaccines that do not have any involvement with troublesome cell lines licensed in the United States (for example, rubella vaccine of the Takahashi strain grown in rabbit kidney cells by the Kitasato Institute of Japan). Vaccine manufacturers may choose not to submit the data for their products to the FDA, perhaps because they believe they have insufficient data to meet FDA standards or because they judge that the commercial market in the United States will not provide a return on the investment needed to obtain an FDA license.

Consider the case of a manufacturer that makes an FDA-licensed vaccine. The license is based on the detailed manufacturing process. The FDA views a change in the media (e.g., cell line) used to grow a virus to be a fundamental change to the way the vaccine is produced. A request for such a change would require a new license, with a new collection of clinical data to show that the vaccine made under the new process was fundamentally the same ("non-inferior" in technical parlance for safety and effectiveness) to the currently licensed product.

Under these conditions, a manufacturer would be confronted with a decision on how to spend several hundred million dollars of its investors' capital. Would it be

---

[23] Carol Rados, "Advisory Committees: Critical to the FDA's Product Review Process," *FDA Consumer* FDA 04-1334C (January–February 2004):1, www.fda.gov/fdac/features/2004/104_adv.html. For more information on the VRBPAC, see www.fda.gov/cber/advisory/vrbp/vrbpmain.htm.

[24] Paul A. Offit, "Why Are Pharmaceutical Companies Gradually Abandoning Vaccines?" *Health Affairs* 24.5 (September–October 2005): 622–630; Stanley A. Plotkin, "Why Certain Vaccines Have Been Delayed or Not Developed at All," *Health Affairs* 24.3 (2005):631–634; M. S. Coleman et al., "Factors Affecting U.S. Manufacturers' Decisions to Produce Vaccines," *Health Affairs* 24.3 (2005): 635–642.

better to change the cell line of a current vaccine (say, a rubella vaccine) or to invest those several hundred million dollars in preventing a disease currently unpreventable? I will leave it to ethicists to debate which is the preferred course of action. But this is the conundrum that confronts the executives who lead vaccine-manufacturing corporations.

These executive decisions raise an important point, because corporations do not make such decisions. Human beings make these decisions. Nor do all employees of a corporation participate equally in such decisions. Most workers, including essentially all blue-collar workers, have no influence. Scientists and inventors involved in the development of new vaccines, and those who establish research priorities and allocate budgets, have a duty to explore the use of non-problematic culture media and to advocate the use of the least problematic culture media applicable. Their ethical responsibility grows as their degree of discretion and decision making grows. Ethical people employed by vaccine manufacturers can work for change from within the company.

Once the FDA licenses a vaccine, the Centers for Disease Control and Prevention (CDC) develops policies on which groups within American society would most benefit from a new vaccine. The CDC consults with its own panel of civilian medical experts (accomplished university professors and senior health department officials), called the Advisory Committee on Immunization Practices (ACIP).[25] Each of these steps is designed to maximize the value of immunization and minimize adverse effects due to immunization.

Action for God's People

For authoritative theological and ethical guidance on problematic cell lines, I defer to expert theologians and ethicists. Clearly, one should bear witness against abortion by asking vaccine executives to stop using cell lines that have roots in two specific aborted fetuses in the 1960s.[26]

As an informed Catholic who wants to do what is right, I conclude that we love our neighbors when we help them receive immunization. If you care for children, act to protect them from dangerous infection by means of immunization. If you have parents or older relatives, help them get an influenza vaccine every fall and a one-time dose of pneumococcal vaccine. And love yourself like your neighbor.

A few Internet sites advocate using measles vaccine, rather than measles-mumps-rubella (MMR) vaccine, to avoid the fetal-cell controversy. Before you follow this advice, realize that such a choice is fundamentally a decision to remain vulnerable to

[25] John D. Grabenstein, "Policy-Making: How the Advisory Committee on Immunization Practices Reached Recent Decisions," *Hospital Pharmacy* 35.2 (February 2000):165–176. For more information on the ACIP, see www.cdc.gov/nip/acip/.

[26] Edward J. Furton, "Catholic Refusals of Immunization," 1–2; Pontifical Academy for Life, "Moral Reflections on Vaccines Prepared from Cells Derived from Aborted Human Fetuses" (June 9, 2005), http://www.academiavita.org/ template.jsp?sez=Documenti& pag=testo/vacc/vacc&lang=English; reprinted in this issue of the *Quarterly* on pp. 541–549.

mumps and rubella, with substantial consequences if infection occurs. If you use the measles vaccine in lieu of the MMR vaccine, children and adults could suffer.

A Patron to Guide Us

Medical professionals and paraprofessionals who immunize patients are doing God's work in protecting the corporal body, preventing premature death and human misery. A patron saint of immunizers could intercede for those who labor to prevent disease, inspire others to take up this calling, and be an example for a virtuous life. A patron could help us reflect on the proper moral course in vaccine decision making. Perhaps, in an allegory of good fighting evil (e.g., vaccines fighting microbes), Michael the Archangel would be a fitting choice. Alternatively, using the allegory of helping those in need, Saint Vincent de Paul might be appropriate.

Regardless, we ask God's wisdom in guiding us in the moral use of vaccines to protect human health. Immunization offers effective defenses against dangerous diseases, guided with that wisdom.